The Influence of Food Insecurity on Neurobehaviors

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BINGHAMTON UNIVERSITY
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CURE
HWS 332

Abstract

- This study looks at correlations between food insecurity and age, gender, location, academics, and income.
- This study was conducted using an anonymous online survey to assess food insecurity and these neurobehaviors.
- Results show that there is a negative correlation between:
  - What region you live in and the total income of your primary household (p < 0.01).
  - Total household income and feelings of depression (p < 0.01).
  - Age and eating limited types of food due to lack of resources (p < 0.01).
- These results can help establish further programs that can help decrease food insecurity effects.

Introduction

- **What is food insecurity?**
  - The condition of not having access to sufficient food, or food of an adequate quality, to meet one's basic needs.
- There are many external factors that may influence food insecurity which then translates to observed impacts on neurobehaviors.
  - These include: Age, Gender, Location, Academics and Income
- The most food insecure age group from the study was 35-44 year olds, followed closely by 25-34 year olds and 45-54 year olds, respectively (the 3 youngest age groups), while the least food insecure was >75 years old. (Fan et al., 2024)
- There is a stronger connection between food insecurity and anxiety in adults with children than those without, mainly due to being twice as likely to worry about food running out. (Nicholson et al., 2021)
- Women are significantly more likely than men to experience food insecurity, especially in female headed households. Economic and societal factors such as lower wages, limited job access, and caregiving roles—contribute to women's increased vulnerability. (Jung et al., 2016)
- Rural living was found to be inversely associated with food insecurity. It is well known that food insecurity varies between countries and is strongly tied to household income level. (Carter et al., 2013)
- A positive correlation between breakfast consumption and academic success has been found, showing that access to nutritious food improves cognitive functioning. (Kawafha et al., 2024)
- Food insecure adults are more likely to consume more highly palatable foods as a coping mechanism, leading to poorer diet quality and increased risks of chronic disease over time. Lower-income, higher food-insecure adults reported higher consumption of higher palatable foods such as those high in fat or "salty snacks". (Leung et al., 2014)
- Food responsiveness and emotional overeating were higher among the children that were in the food-insecure group versus the food-secure group. (Epstein et al. 2023)

Limitations

- Only 156 responses were collected which could have led to different results than if a larger population was surveyed.
- Self reporting. (Accuracy of data)
- Variation of collection methods.

Acknowledgement

We gratefully acknowledge the support of the Health and Wellness Studies Department for the research opportunity and for Binghamton University Research Days

Methods and Demographics

- The Food Insecurity and Neurobehaviors survey was distributed through social media and text message.
- There was a total of 156 responses.
- Data was coded and analyzed using Pearson's Correlation Analysis with SPSS 28.0.

Figure 1: Age of Participants
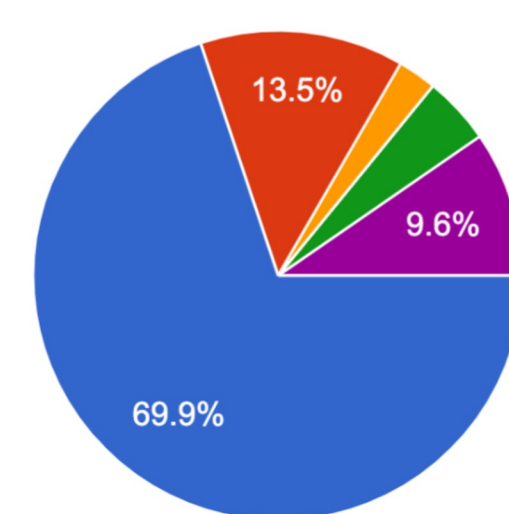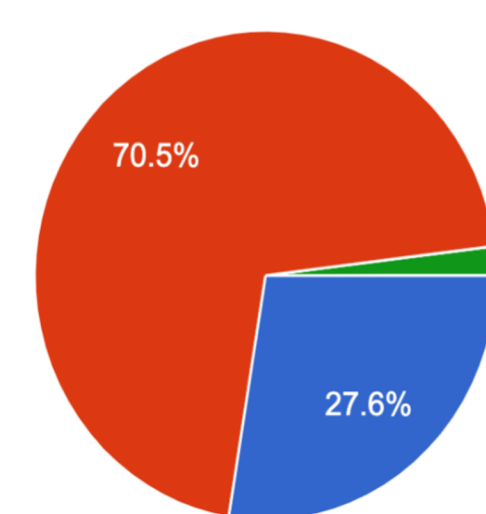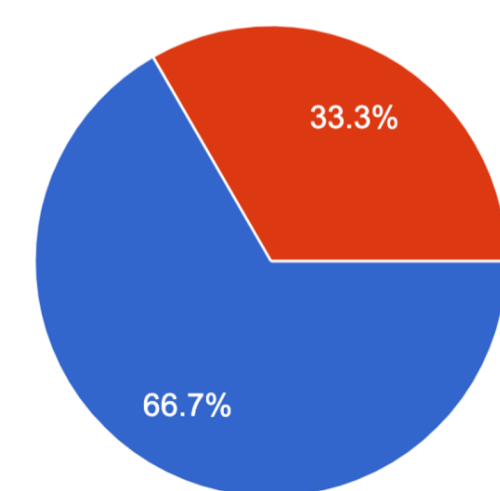

Figure 2: Gender of Participants

Figure 3: College Enrollment of Participants

Results

Table 1: Relationship Between Age, Food Insecurity, and Neurobehaviors

Relationship	Conclusion
Relationship between age and a time when, because of lack of money or other resources you ate only a few kinds of foods.	-.203*
Relationship between age and frequency of feeling nervous	-.277**

Table 2: Relationship Between Gender, Food Insecurity, and Neurobehaviors

Relationship	Conclusion
Relationship between stress frequency and gender.	.278**
Relationship between gender and personal income last year.	.750**

Table 3: Relationship Between Location, Food Insecurity, and Neurobehaviors

Relationship	Conclusion
Relationship between location and total income of primary households.	-0.306**
Relationship between feeling confident about ability to handle personal problems and location.	-0.160*

Table 4: Relationship Between Academics, Food Insecurity, and Neurobehaviors

Relationship	Conclusion
Relationship between academics and highest level of education and feeling like due to lack of money or other resources one ate less than you thought you should.	-0.171*
Relationship between academics and Highest level of education and feeling like due to lack of money or other resources one ate only a few kinds of foods.	-0.169*

p < 0.05 = *   p < 0.01 = **

Table 5: Relationship Between Income, Food Insecurity, and Neurobehaviors

Relationship	Conclusion
Relationship between income and High level of income skipping a meal due to lack of money or other resources.	-0.249**
Relationship between high level of income and feeling so depressed that nothing could cheer you up.	-0.187**

Discussion and Conclusion

Discussion:
- Income has the most significant correlation with food insecurity.
  *Individuals who responded having a higher income also showed lower levels of food insecurity
  *Lower-income families or areas typically have less access to fresh and whole foods that are also affordable, and not having enough money to afford food makes levels of food insecurity higher. (Leung et al., 2014)
  *Those who responded having a higher level of food insecurity also responded having higher levels of depression or negative thoughts, linking the areas of income, food insecurity, and certain neurobehaviors such as anxiety and motivation.
- Academic level impacted rates of food insecurity by reflecting that people with higher level degrees typically experienced less feelings of food insecurity along with lower rates of depression.
- Food insecurity did not have a significant correlation with age.
  *Although they were insignificant, each variable had a negative correlation, showing younger people are slightly more affected by food insecurity.
  *This is due to limited income or unstable living conditions (Nicholson et al., 2021).
  *These factors likely contributed to a significant negative correlation between age and anxiety.
- Location is also correlated with food insecurity.
  *People in rural and urban areas have limited access to affordable, nutritious food. (Carter et al., 2013)
- Women reported a lower average income than males and also reported a higher level of food insecurity. Women are also found to be more stressed than men on average. (Jung et al., 2016)

Conclusion:
- The data reflected that there is a higher rate in food insecurity among people who live in lower income households or regions.
- Food insecurity is also moderately influenced by demographic and socioeconomic factors such as age, location, and academic status. These factors can affect income, accessibility, and ability to afford food, which will influence food insecurity.

Recommendations

- Supporting local businesses especially in lower income areas.
- Creating food gardens in lower income areas to support the growth of healthy and whole foods in areas that usually do not have access to them.
- Lowering the cost of whole or healthy foods, making them on par with the unhealthier options.
- Creating more job opportunities in lower income areas.
- Starting small businesses within walking distances of communities that promote healthy options.
- Eating breakfast every morning to promote academic success.
- Eating healthier food options closer to tests/exams to improve brain function.
- Organize food drives.
- Ensure universal school meals.

References